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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/701,442	11/06/2003	Ming Chih Lu	LUMI 3001/EM	7615

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EXAMINER

LAI, ANNE VIET NGA

ART UNIT	PAPER NUMBER
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2636

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/701,442

Applicant(s)

LU, MING CHIH

Examiner

Anne V. Lai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 8-16 is/are rejected.
- 7) ☒ Claim(s) 6 and 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4 and 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Cullen et al** [US. 3,895,870] in view of **Kooijman et al** [US. 5,401,979].

Regarding claim 1, **Cullen et al** disclose a device for gauging levels of a stored object, comprising:

two laser emitters for projecting laser light sources onto the object and forming two laser dots;

a VIDICON camera for identifying image signals of said laser dots and/or monitoring any alteration (deformation) of the object; and

a timer circuit for calculating time interval (time separation) between said image signals of said laser dots (fig. 1; col. 3, lines 5-35; col. 4, line 38 through col. 6, line 19).

Cullen et al do not specifically use a CCD camera, however the use of CCD camera in optical measurement is known; **Kooijman et al** teach one can alternatively use a CCD camera or a VIDICON camera to inspect an object lighted by laser light sources (col. 10, lines 22-31). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made a CCD camera can be

used as well as the VIDICON camera in the gauging device of **Cullen et al** based on designer preference for convenient of supply or cost.

Regarding claim 4, **Cullen et al** disclose the CCD camera and the laser emitters are mounted on an identical base (10, fig. 1).

Regarding claim 10, **Cullen et al** disclose the level-gauging device is mounted within a head 10 (fig. 1); although the light blocking mask is not specify, it would have been obvious to one having ordinary skill in the art at the time of the invention was made blocking the light into the head reduce ambient light interference with the emitted laser light and the received dots images, therefore increase the precision of the gauging.

Regarding claims 11-16, **Cullen et al** disclose the timing circuit (fig. 9; col. 10, line 26 through col. 16, line 8) comprises logic gates, timing counter, triggers, scan line timer; although a microprocessor is not disclosed, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to coordinate the functioning of all circuitry elements above, the implementing of a microprocessor and instruction program are preferred to provide accuracy to the level gauging.

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Cullen et al** and **Kooijman et al** in view of **Vann** [US. 6,115,128].

Regarding claim 2, **Cullen et al** disclose gauging the level of deformable objects or materials (plastic, food, etc.); **Vann** teaches a position sensor using camera and laser light source for measuring liquid level stored in a small container. It would have been obvious to one having ordinary skill in the art at the time of the invention was made,

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liquid and powder particle are also deformable objects or materials, therefore the gauging device of **Cullen et al** can be applied to gauge the level of liquid, powder particle and a variety of other deformable objects or materials for cost saving purpose.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Cullen et al** and **Kooijman et al** in view of **Holliday et al** [US. 6,043,876].

Regarding claim 3, **Cullen et al** disclose using helium-neon type laser emitters but do not specify the laser emitters are laser pointers. **Holliday et al** teach a laser emitter light source in optical measuring or testing can be a helium-neon laser pointer (col. 2, lines 42-49). It would have been obvious to one having ordinary skill in the art at the time of the invention was made the use of a laser pointer as laser emitter is based on preference of the circuit designer or convenient of supply or cost.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Cullen et al** and **Kooijman et al** in view of **Almquist et al** [US. 5,258,146].

Regarding claim 5, **Cullen et al** do not specify the level-gauging device has a reflector floating on the surface of the stored object. **Almquist et al** teach a device for gauging fluid level in a container comprising a floating reflector on a polymerizable fluid surface to improve the reflection of dots formation to the sensor (claim 29; col. 223, lines 44-51). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to implement a floating reflector in **Cullen et al** device for gauging level of particular liquid to improve the formation of laser dots therefore improvement the accuracy of the measurement.

6. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Cullen et al** and **Kooijman et al** in view of **Klein II et al** [US. 5,757,498].

Regarding claim 8, **Cullen et al** omit specify a transparent divider disposed between the gauging device and the object storage tank. **Klein II et al** teach a laser displacement sensor wherein the sensor head has a transmitting and receiving window made of aspherical glass lenses useful to reduce optical aberrations (col. 3, line 31-36). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to use a transparent divider such as strengthened glass lenses as taught by **Klein II et al** for the gauging device for protecting the sensor in the gauging device from damages caused by fluid in the tank and also to reduce optical aberrations in the measurement.

Conclusion

7. Claims 6 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Buckley discloses an aeronautical device for determining the ceiling height of a fog bank. [US. 2,081,134]

Bohlander et al disclose an apparatus for determination of the position of a surface. [US. 4,453,083]

Ishida discloses a liquid level indicator using laser beam. [US. 4,938,590]

Hartrumpf discloses a process and apparatus for determining the position of an object. [US. 5,146,290]

Furuhashi discloses a method and an apparatus for measuring the shape of glossy object. [US. 5,414,517]

Jurca disclose a method and an apparatus for determining the distance between a base and surface by means of radiation reflected at the surface. [US. 5,933,240]

Franklin et al disclose a method and apparatus for determining the distance of an object. [US. 4,766,323]

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne V. Lai whose telephone number is 571-272-2974. The examiner can normally be reached on 8:00 am to 5:30 pm, Monday to Thursday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hofsass Jeffery can be reached on 571-272-2981. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A. V. Lai 
March 15, 2005


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